TESTIMONY OF ENVIRONMENTAL DEFENSE

CONCERNING

THE WEST COAST GROUNDFISH FISHERY DISASTER

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Thank you for this opportunity to testify. I am a marine ecologist and senior scientist with Environmental Defense. Environmental Defense is a national non-governmental organization with over 300,000 members. We use science, law, and economics to craft durable and sensible solutions to environmental problems. I have been working to improve the management of west coast groundfisheries for about 9 years. In addition to my research and writing on the subject, I have served on the Pacific Fishery Management Council's Groundfish Advisory Panel, Habitat Steering Committee, Alternative Groundfish Management Committee, and Marine Reserve Committee.

SUMMARY

My view is that inadequate science and risk-prone management caused the west coast groundfish disaster. Stock assessment scientists could not produce reliable stock assessments because inadequate funding resulted in patchy sampling of fish biomass. As a result, scientists had to rely heavily on fishery-dependent data such as

catch statistics, which are known to be misleading. In addition, the most basic fishery statistic of all, total fishing mortality, remains unknown to this day due to the lack of an observer program and reliable logbook records. Scientists advising the Pacific Fishery Management Council (PFMC) and the National Marine Fisheries Service (NMFS) failed to make the large amount of uncertainty associated with stock assessments and the theory of Maximum Sustainable Yield clear to managers, choosing instead to offer multiple alternative models.

While some Council members called for precautionary management, too often the Council, as a whole, simply chose the models which supported status-quo catch levels, or, when cuts were called for, chose intermediate reductions in allowable catch. They sought to minimize short-term economic losses more often than they chose to err on the side of conservation. This tendency was reinforced by a management system that was captured, by and large, by the fishing industry. The fishing industry, with a few exceptions, emphasized the uncertainty inherent in stock assessments and opposed precautionary cuts in allowable catch, arguing that such cuts would result in unjustifiable short-term economic impacts. Environmentalists, along with some scientists and fishermen, took a longer view, warning that the PFMC's harvest policy was too aggressive given the uncertainty surrounding stock assessments. They urged the PFMC to establish marine reserves to buffer against uncertainty, adopt a more conservative harvest policy, and to make precautionary cuts when it became clear that many groundfish species were not as productive as once thought. However, these recommendations were generally ignored until recently.

The solution is to reduce fishing capacity (ideally with an Individual Fishing Quota program), establish marine reserves where no fishing would be allowed, provide financial assistance to fishermen displaced by management policies, improve the scientific basis for management, and reform the management structure and process.

DIAGNOSIS OF A FISHERY DISASTER

The west coast is the world center for rockfish diversity and was home to very large populations of many kinds of groundfish. They were mostly left alone prior to the 1960's, but fishermen started to catch more of them as

the salmon fisheries declined. In the 1970's, groundfish landings began to exceed salmon landings. The groundfish fishery became very large and valuable.

However, this fishery was based on fishing down large populations. Fishery scientists assumed that groundfish reproduction would increase as these populations were thinned out, reducing competition between fish for mates, food, habitat, and other ecological essentials. So they recommended that managers allow fishermen to harvest them at a constant rate, regardless of how abundant the populations were.

The PFMC's scientists recommended a fixed harvest rate that would reduce the reproductive output of groundfish stocks to about 35% of their original levels, with the expectation that this would eventually result in maximum sustainable yield from thinned out populations. No minimum biomass threshold was recommended.

Managers readily adopted this recommendation, despite great uncertainty about stock abundance and productivity. This uncertainty resulted mainly from the lack of systematic and reliable methods for estimating or predicting either of the two main quantities needed to set an allowable catch limit: the number or biomass of fish, and the actual number or weight of fish killed by fishing. Fish biomass was and is difficult to estimate because under-funded research efforts resulted in patchy and infrequent sampling. Furthermore, sampling gear may miss a lot of fish that live in rocky habitats, because it tends to snag in such habitats. Total fishing mortality, the most basic of all fishery statistics, remains unknown due to the lack of an observer program and reliable logbook records. Fishing mortality is hard to predict or control because it often depends on weather and markets. These uncertainties were compounded by natural variability in ocean productivity.

Many environmentalists and scientists called for more conservative harvest rates. In fact, William Clark, the scientist who originally recommended the 35% level in a 1991 paper, later amended his recommendation to a more conservative 40% in a 1993 paper. However, the PFMC adopted the 35% policy in 1990 and reaffirmed this choice for most groundfish in 1997, four years after Clark published his amended analysis. To the PFMC's credit, they did adopt a more conservative harvest rate for

rockfish in 1997, based on the emerging consensus that these fishes were particularly vulnerable to fishing due to their long lives and sporadic reproduction. But by then, several stocks had declined to very low levels, precipitating drastic cuts in allowable catch.

There are indications in PFMC's publications that the Council was aware of the dangers of adopting the 35% policy. The main danger was that fishing at that rate could reduce average spawner biomass to unsustainably low levels, because fishing down the stock could result in reduced recruitment, which in turn could lead to less spawners – a vicious cycle of depletion. Environmentalists and some scientists certainly made their concerns clear. However, arguments for more precautionary management were often answered by arguments from the fishing industry that management was already too precautionary and that further cuts in allowable harvest would harm fishermen. The industry's arguments proved more persuasive.

Unfortunately, it turned out that those calling for more precautionary management were right. The large populations of groundfish that existed prior to the fishery were probably necessary to sustain these species in a highly variable ocean environment. So, fishing them down to a fraction of their original levels was not a good idea. Furthermore, most of the reproductive capacity of these populations was probably concentrated in the older fish, which in many cases are not much larger than fish with much lower reproductive capacity. The fishery could not discriminate between these two size classes, by and large, so the most reproductively valuable elements of the groundfish populations were depleted. This probably reduced recruitment in turn, leading to a downward spiral exacerbated by generally poor ocean productivity off the west coast since about 1977, and further exacerbated by El Nino events that appeared to get longer and more intense in the 1980's and 1990's.

This poor science and incautious management occurred against a backdrop of a heavily overcapitalized groundfish fleet. The fleet became overcapitalized partly in response to government subsidies, but also in response to the management regime itself. The abundant groundfish stocks attracted fishermen while the salmon fishery was collapsing. Open access to the groundfishery

encouraged investment in more and bigger vessels. The implementation of allowable catch limits resulted in shorter seasons, creating an incentive to invest in still larger and more efficient vessels and gear. In such a fishery, there is little incentive to leave fish in the water for conservation purposes, since those fish will be caught by the next fishermen who comes along. The incentive is to engage in a "fish arms race" to win the competition for fish. As groundfish populations declined, the fishing industry could or would not adjust quickly enough. It has been estimated that the fleet had the capacity to harvest several times the allowable catch by the late 1990's. Thus, fishermen were right in arguing that cuts in allowable catches would hurt economically. Payments on vessels and gear purchased while fishing was good had to be made whether the fish were abundant or rare.

Some environmentalists, scientists, and fishermen advocated the use of transferable Individual Fishing Quotas (IFQs) for harvest privileges to turn these incentives around. By dividing the allowable catch into transferable percentage shares, IFQ programs convert fishermen from resource users into investors in a healthy fish population, since their share values increase as the resource prospers. IFQs are especially effective at ending destructive and wasteful races for fish, and at bringing investment into alignment with allowable catch levels. IFQs also allow the industry a way to more quickly adjust to changes in fish abundance by buying and selling shares.

The tragedy of the west coast groundfishery disaster is that it could have been avoided. The PFMC could have adopted a conservative harvest policy based on the precautionary approach, but it often chose to acquiesce to industry demands for less conservative policy choices. It could have instituted weak stock management for the multispecies groundfish fishery, shutting the fishery down when allowable catch limits for the least productive stock was reached. However, this was deemed too costly. It could have established marine reserves, where no fishing is allowed, to protect fish populations from uncertain stock assessments and management errors, but it ~~didn't~~did not.

SOLUTIONS

- First, the federal government should provide financial assistance to fishermen displaced by the failed policies of the past and by policies intended to help rebuild the fishery, such as reduced catch quotas and marine reserves.

Although many fishing industry representatives argued against the more conservative policies that would have averted the disaster, it is the government's responsibility to protect the public's larger interests. Thus, the government should be held accountable for this management failure.

- Fishing capacity should be reduced immediately, ideally by implementing an IFQ program.

The National Research Council recently issued a report requested by Congress on IFQs. This report recommends that Congress lift the moratorium on IFQ programs. The PFMC has already put considerable resources into developing an IFQ program for fixed gear sablefish. If an IFQ program is not adopted, the federal government should authorize sufficient funds to buy a significant number of the existing groundfish vessels, not just their fishing permits. Excessive fishing capacity not only reduces profits, it also creates a strong incentive to argue for less conservative policies.

- Marine reserves in which all fishing is banned should be implemented as soon as possible.

Marine reserves demonstrably allow depleted fish species to recover more rapidly than in fished areas. A recent scholarly survey of 89 scientific papers on marine reserves revealed that 90% of the reserves studied had more fish biomass compared with fished areas. Fish biomass within reserves was on average three times higher. Fish were also significantly larger in 83% of the reserves than in fished areas. These larger fish tend to have much more reproductive capacity than younger, smaller fish characteristic of fished areas. For example, one female Pacific ocean perch (S*ebastes alutus*) that is about 9 inches long generates 10,000 eggs, while one that is twice as long generates 300,000 eggs (30 times more). Therefore, one would expect that a fish protected within a marine reserve would yield much greater reproductive "bang for the buck" than a fish

protected with fishery management (e.g., lower catch rates).

- Improve the scientific basis of fisheries management

The PFMC's response to uncertain stock assessments was to add another level of review to scrutinize the stock assessments. This did not address the root problem, however. Stock assessment scientists do the best they can with very limited and often misleading data. The interpretation of such limited data is often brilliant, but the fact remains that the data are limited in both quantity and quality.

The way to reduce uncertainty in stock assessments is to increase the amount of fishery-independent data. The new observer program will help, but the observers can only count fish that are hauled to the surface during a fishing trip. Surveys of fish abundance that do not depend on the fishery at all are needed, because catch rates can remain high even as fish populations decline, due to the skill of fishermen at finding remaining fish aggregations. Existing fish surveys by NMFS need improvement, because they may miss a lot of rockfish species living in high relief rocky habitats that are relatively inaccessible to the sampling gear. They should also be done more frequently and over wider areas. Surveys using underwater cameras and video may be the most cost-effective way to obtain fishery-independent data.

Equally important, the theoretical basis for fishery management must be improved. The theory of maximum sustainable yield (MSY) has failed for many groundfish species. This theory posits the existence of a curvilinear relationship between spawner biomass and recruitment. Harvest policy recommendations based on the theory are very sensitive to the shape of this curve. However, actual data are highly variable. Hence, curves must be fitted to the data statistically, opening the door to uncertainty and various interpretations. This results in unreliable estimates of the catch rates and biomass levels expected to produce MSY. More effort should be directed at understanding the causes of variability in recruitment, including the influence of environmental conditions and ecological interactions. Fish populations cannot be modeled as if only spawner biomass mattered.

- Reform the management system

Reforming the management system may be the most difficult reform of all, but may be the most important. Some Council members took courageous stands in favor of precautionary management. But it seems unreasonable to expect people who represent the fishing industry to consistently support long-term sustainability and ecosystem protection, in the face of pressure to avoid short-term economic impacts that often accompany such policies.

The make-up of the Pacific Fishery Management Council should better reflect the diversity of groups interested in the fisheries it manages, and in the ecosystems its policies affect. More scientists, conservationists, and consumer advocates should sit on the Council. NMFS should more rigorously implement the precautionary approach, and provide objective, apolitical oversight over the Council’s recommendations.